

AMENDMENTS TO CLAIMS

Claims 1-18 (previously canceled)

19. (currently amended) A catheter comprising:

a catheter body having a proximal end and having a distal end;

said catheter body defining an axis;

a fluid supply lumen in said catheter body terminating near the distal end, for connection to a device for injecting fluid at a supply rate;

one or more apertures at the distal end of the catheter body, connecting the fluid supply lumen with the exterior surface of said catheter body;

said aperture defining [at least one] a first aperture direction for the emerging flow that lies between approximate ninety degrees and forty-five degrees, as measured from an axis along the catheter body, where zero degrees corresponds to a directly retrograde flow and ninety degrees corresponds to lateral fluid ejection from the catheter body, and whereby a primary fluid jet ejected from said aperture initially flows in said first direction;

said aperture cooperating with a control body proximate said catheter body to [direct] permit entrainment of ambient fluid into said primary fluid jet flow forming a combined flow;

[a] said primary fluid jet flow of fluid emerging from said aperture adjacent said control body forms said combined flow along said control body such that combined fluid flows in a [retrograde] second direction which differs from said first direction [from said distal end toward said proximal end];

[a] said control body surface located immediate adjacent said aperture, providing a barrier located proximate said aperture, said barrier [for] limiting fluid entrainment on one side of the primary fluid jet and promoting entrainment on the opposite side of the primary fluid jet proximate [from] the location of said control body, near the aperture [by] where the primary fluid jet is emerging from the aperture, whereby said primary fluid jet and the combined flow is deflected by a pressure difference across said primary fluid jet and said combined flow caused by said barrier.

20. (previously canceled)

21. (previously presented) The catheter device of claim 19 wherein a tangent drawn to said control body surface at the location of the aperture is parallel to the aperture direction.

22. (previously presented) The catheter device of claim 19 wherein a tangent drawn to said control body surface at the location of the aperture forms an included angle with the aperture direction that is greater than zero degrees and less than ninety degrees.

23. (previously presented) A extraction catheter system for removing embolic material from a vessel having a vessel diameter, said system comprising:

a sheath having a sheath lumen adapted to receive and guide a catheter, said sheath having an exterior diameter sized to fit in said vessel partially occluding but not totally occluding said vessel;

said catheter having a catheter body having a distal end and a proximal end and having an interior and an exterior surface;

a fluid supply lumen in said catheter body, for connection to a device for injecting fluid at a first rate;

a fluid aperture connecting said fluid supply lumen with the exterior surface of said catheter body;

said fluid aperture located proximate a control body whereby said fluid port and said control body cooperating to attach fluid ejected from said fluid port to said control body;

whereby said fluid ejected by said port mixes with embolic material and follows the catheter body in a retrograde direction, transporting the fluid and embolic material into said sheath lumen where it is collected at a second rate.

24. (previously presented) The catheter system of claim 23 wherein said catheter distal end is located within said sheath lumen.

25. (previously presented) The catheter system of claim 23 wherein said catheter distal end is located outside said sheath lumen.

26. (previously presented) A method of using a catheter system to remove material in a vessel comprising:

advancing a sheath having a sheath lumen to a location near material to be removed, said sheath partially but not totally occluding said vessel;

advancing a catheter of the type having a fluid port to eject fluid proximate a control body thus creating a retrograde flow, through said sheath lumen to a location near material to be removed;

injecting fluid into said catheter causing fluid to emerge from the catheter, entraining material located near said catheter;

removing said fluid and entrained flow from said sheath lumen.